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MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION BUREAU
POINT SOURCE STUDIES SECTION

Report of an
Industrial Wastewater Survey
Conducted at
TRW INC.
All Outfalls No. 340020
Ionia County
Portland, Michigan
May 13-14, 1980

Survey Summary

Wastewater monitoring was performed during one twenty-four hour survey period starting Tuesday, May 13, 1980.

The results of this survey met the final limitations in the facility's Water Resources Commission Stipulation No. 00178 (Table 3).

The survey results are compared to the self-monitoring results reported in the company's Monthly Operating Report. Survey results are slightly lower than the concentrations reported by the company (Table 3).

The composite sample was split with the company for comparison of laboratory results. The company's suspended solid concentration was slightly greater than the Environmental Protection Bureau Laboratory result (Table 4).

The last survey conducted at this company was in May, 1978. Results from both surveys are similar except for flow. The flow this survey was about half the previous survey's flow (Table 5).

Survey Comment

The geometric mean of four fecal coliform grab samples collected during the survey was 14,000 cts/100 ml.

Plant Process

TRW Inc., Portland Works, manufacturers and assembles steering components for heavy road equipment. The plant operates 24 hours a day, 5 to 6 days a week. The company employs 330 people at the plant. $330 \times 20 \text{ gpd} = 6600$

The plant receives unfinished forgings, which are machined, heat treated, assembled and shipped. Some parts are forged at the plant from steel stock and then machined and assembled.

Water, Wastewater & Treatment

All the water used at the plant is from the City of Portland. Domestic wastewater is discharged to six septic tanks and operated in a series, which overflow to the first of three settling lagoons.

Roto Finish Machines

Process and cooling wastewater from the parts washers, heat treating operation, cooling towers, air compressors, boiler blowdown, bonderizer line and paint room are discharged to one of two storage tanks. Ferric chloride and a anionic polymer are added. The wastewater as it is pumped from the storage tank to a clarifier. The effluent from the clarifier is discharged to the first of three lagoons operated in series. The final lagoon discharges to a swampy area, which is the flood plain of the Grand River, outfall 340020 (Figure 1).

Sludge from the clarifier is pumped to a sludge drying area near to the clarifier. Not acceptable should phase out

Stormwater runoff from the roof and parking lots is discharged into the first lagoon.

Survey Procedure

The flow and sample were obtained as follows:

Outfall	Flow Measurement	Sampling
340020	Staff installed 12" rectangular weir & water level recorder.	Automatic scoop-type sampler & individual grab samples.

A water level recorder provides a continuous account of the liquid level or head above the crest of a weir. A head versus time graph is obtained for the duration of the survey period. The total volume of wastewater over the weir or during the survey period is computed from the graph.

An automatic sampler composites samples at timed intervals. Samples may be proportional to the instantaneous flow over the weir or through the flume.

Polychlorinated biphenyl (PCB) composite samples are collected by the grab composite method.

A grab composite consists of a series of individual grabs composited into one sample.

An individual grab is a single instantaneous sample.

Samples were analyzed by the Environmental Protection Bureau Laboratories located in Lansing.

Samples were preserved according to Table 6. The results of the physical, chemical and bacteriological analyses are presented in Tables 1 & 2.

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DISTRICT 3
WATER QUALITY DIV.

Overnight

340020

Survey Period	From	To
5-13-80 - 1300		
5-14-80 - 1300		

Computed flow rate* (M ³ /day)	0.1 m/sec
Highest flow rate (M ³ /day)	482 - 5-13-80 @ 2048
Lowest flow rate (M ³ /day)	287 - 5-13-80 @ 1301

	<u>mg/l</u>	<u>kg/day</u>
Suspended solids	22	8.5
Dissolved solids	532	206

COD	97	38
TOC	30.	12

Phenol	0.048	0.019
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BOB	77	4.3
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Nitrate & nitrite nitrogen-N	0.04	0.02
Ammonia nitrogen-N	0.82	0.32

total phosphorus-P	0.44	0.17
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Total chromium (Cr)	Total copper (Cu)
< 0.05	—
< 0.02	—
—	—

Total lead (Pb)	Total zinc (Zn)
0.05	0.05
0.05	0.05
0.05	0.05

L/bn

PCB 1242

PCB 1260 $\lambda < 0.7$ --

* Flow rates used in the computation of kg/day.
To obtain MGD multiply M³/day by 0.0002642
To obtain lbs/day multiply kg/day by 2.205

100,000 lbs

Table 2 Analyses of grab samples.

[illegible]

- 1 - Flow at time of grab sampling.
2 - Values determined in the field at time of sampling.

Table 3 Comparison of survey results with the facility's Stipulation and Monthly Operating Report.

Parameter (Unit)	Stipulation Limitations	May Monthly Operating Report				Survey Results ¹
		Daily Maximum	Monthly Average	Monthly Maximum	5-13-80	
340020						
Flow (M ³ /day)	--	255	405	376	114	387
Suspended solids (mg/l)	35	29	36	36	36	22 (24, 26)
Oil & Grease (mg/l)	15	8	12	5	9	(<2, <2)
pH (S.U.)	not <6.5 nor >9.0	min. 7.8	9.0	8.55	8.7	(8.0, 7.4)

- 1 - Survey results are for the composite sample. Grab sample ranges are shown in parentheses ().
To obtain MGD multiply M³/day by 0.0002642
To obtain lbs/day multiply kg/day by 2.205

Where is company data collected?

Table 4 Comparison of the laboratory analytical results obtained by TRW Inc. Portland and the Environmental Protection Bureau from the split composite sample.

Outfall	340020	
	TRW Inc.	E.P.B.
Flow (M ³ /day)	376*	387
	mg/l	mg/l
Suspended solids	36	22

* Flow obtained from company totalizer.

Table 5 Comparison of the previous survey results with the results obtained in this survey.

Outfall	340020	
Survey Date	From	To
	5-30-78	5-13-80
	5-31-78	5-14-80
Flow rate (M ³ /day)	660	387
	mg/l	mg/l
Suspended solids	25 ✓	22
Dissolved solids	570 ✓	532
COD	72 ↑	97
Phenol	0.02 ✓	0.048
BOD ₅	27 ↓	11
Total chromium (Cr)	< 0.01 ✓	< 0.05
Total copper (Cu)	< 0.01 ✓	< 0.02

Table 6 Sample Preservation

Parameter	Preservative
COD & TOC	10 drops conc. H ₂ SO ₄ /250 ml (to pH <2).
Cyanide & Phenolics	Dechlorinate with ascorbic acid (if needed). 10 drops 10 N NaOH (to pH 12)/250 ml.
Total Metals	2 ml 1:1 HNO ₃ /250 ml (to pH <2).
Microbiology	2 drops 10% sodium thiosulfate/125 ml to dechlorinate sample.
Oil & Grease	10 drops conc. H ₂ SO ₄ /250 ml (to pH <2).

All samples cooled to 4°C and preserved upon collection and chain of custody maintained.

Survey by: Gary Boersen, Environmental Engineer
Edward Hamilton, Water Quality Technician
Joseph Hey, Water Quality Technician

Contact with Management: Mike Fox, Industrial Engineer

Certified Operator: Gary Hattis, Waste Treatment Operator

Hydrocarbon Analyses by: Environmental Protection Bureau Laboratory

Physical, Chemical &
Bacteriological Analyses by: Environmental Protection Bureau Laboratory

Report by: Gary Boersen
Joseph Hey
Point Source Studies Section
Environmental Services Division
Environmental Protection Bureau
Michigan Dept. of Natural Resources

Distribution "A"
MM

Figure 1 Vicinity Map of TRW, Inc. and Surrounding Area of Portland

